HISTORICAL NOTE

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Wilhelm Heinrich Erb (1840–1921) and his contributions to neuroscience

Wilhelm Heinrich Erb was a renowned German neurologist and an eminent physician of his time. He is well known for his innovative contributions to neurology. Erb became known primarily for his contributions to diagnosing and treating various neurological disorders. He was one of the clinicians to use electricity in the diagnosis and treatment of nervous disorders.[1] Duchenne should not be overlooked in the history of electrical stimulation. He used his electrical stimulation technique, which he called ''électrisation localisée'' (localised faradisation), as a clinical diagnostic and prognostic tool, as well as a physiological means of exploring the anatomy of the living.[2]

Apart from Erb's description of the disorders to which his name is attached, he pioneered the usage of reflex hammer in neurological examinations. Additionally, he introduced the term ''tendon reflex''. He gave his name to paralysis of the brachial plexus and described important neurological terms.[1]

Erb was born in Winweiler, the Bavarian Palatinate, on 30 November 1840, to a forester, Friedrich Erb. In 1857, he entered medical school in Heidelberg and also studied in Erlangen and Munich. When he was 22 years old, he returned to Heidelberg and become an assistant to a well known pathologist and neurologist Nikolaus Friedrich (1825–1882). Erb's first scientific interest was toxicology and histology, and he dealt with the effects of picric acid on the organism and the development of erythrocytes. Under the guidance of Friedrich, Erb become attracted to the study of the nervous system.[3] After completing his habilitation in 1865, he was promoted to Privatdozent and gave lectures at the University of Heidelberg. In 1880, he went to the University of Leipzig where he served as the director of the outpatient neurology clinic and set up an independent neurology unit.[4] Paul Julius Möbius (1853–1907) and Emil Kraepelin (1856–1926) worked here as voluntary assistants under his guidance. In 1883, he became Fellow Professor of Internal Medicine at the University of Heidelberg where he was head of a new neurological hospital. In 1891, he contributed to the foundation of the ''*Deutsche Zeitschrift für Nervenheilkunde*'', later renamed ''*Zeitschrift für Neurologie*'', which finally became the ''*Journal of Neurology*''. Erb's contribution to the first volume of the journal was a survey on muscular dystrophies.[4]

Erb was a mentor for many internationally well known scientists such as Ernst Julius Remak (1849–1911), Friedrich Schultze (1848–1934), Paul Julius Möbius (1853–1907), Emil Kraepelin (1856–1926), Ernst Adolf Gustav Gottfried von Strümpell (1853–1925), Max Nonne (1861–1959), Johann Hoffmann (1857–1919), Otto Cohnheim (1873–1953) and Henry M. Thomas (1891–1966).

Erb made early observations relating to syphilis and tabes dorsalis. In his studies on tabes dorsalis, he investigated the relationship between them and published several papers. He reported on juvenile forms of progressive muscular atrophy[5] and elaborated on the difference between myoatrophies and myodystrophies. In 1891, Erb suggested that muscular dystrophies were a primary degeneration of muscle and coined the term ''dystrophia muscularis progressiva''.[6] He popularised electrodiagnostics in neurology and demonstrated increased motor nerve irritability in tetanus. His manual entitled ''*Handbuch der Elektrotherapie*'' was a neurological standard work of its time.

He was one of the first clinicians to use the reflex hammer during physical examinations. Interestingly, the deep (or patellar) tendon reflex was first introduced simultaneously into medical literature by Erb and Carl Otto Friedrich Westphal (1833–1890). Both scientists published their results separately in the January 1875 issue of *Archiv fur Psychiatrie und Nervenkrankheiten*, where Westphal was an editor. Westphal used the term ''the lower limb phenomenon'' (*Unterschenkelphänomen* in German) whereas Erb used the term patellar tendon reflex (*Patellarsehnenreflex* in German) and correctly regarded the phenomenon as a true reflex arch.[7] Erb pointed to the spinal cord levels as presumably corresponding to the reflex arches of the various individual tendon reflexes.

Several eponyms are named after him, including: Erb–Duchenne palsy (also known as Erb's palsy), Erb–Charcot paralysis,[8 9] Erb's point,[1] Erb–Westphal symptom,[10 11] Erb's dystrophy (also known as Erb's scapulohumeral dystrophy),[12] Erb's phenomenon,[13] Erb's reflex (also known as biceps femoris reflex)[10] and Erb–Goldflam disease.[14 15]

Erb was one of the leading figures in neurology. He retired in 1907 and became an honorary member of many scientific societies. He remained Honorary President of the Society of German Neurologists (*Gesellschaft Deutscher Nervenärzte*) until he died. He also experienced much sadness in his life. Only one of his four sons survived him. Two of his sons died and the third died during World War I. In his last days he caught cold which progressed to bronchopneumonia. He closed his eyes to neuroscience and his workaholic life in Heidelberg on 29 October 1921.

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